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Building & Highway Material Testing Laboratory

NABL - Accredited Laboratory as per ISO / IEC-17025 :2005

T-2377

Job No.: CTCE/BBMP/W.No.06/YBR/CSR-07/083c/CEMENT/2016-17

Date: 05.07.2016

TEST REPORT ON CEMENT

* CUSTOMER	:	**Asst. Executive Engineer,** Byatarayanapura Sub Division, BBMP, Bangalore.
*AGENCY	:	**Mr. Y.B. Ramesh,** No.34, Down Bazaar Road, Yelahanka, Bangalore - 64.
*NAME OF THE WORK	:	Improvements to roads and drains at Anjanadri Layout in Ward No.06, Byatarayanapura Sub Division, BBMP, Bangalore.
*REFERENCE	:	EE/BTP/BBMP/E-PMT/ /2015-16
SAMPLE ID	:	Cement
SAMPLE RECEIVED ON	:	04.07.2016
PERIOD OF TESTING	:	04.07.2016 to 05.07.2016

The results of the tests conducted on the cement sample are as follows:

Sl. No	Descriptions	Test Method as per IS	Test Result	Requirements as per IS: 8112-2013
1	Standard Consistency	IS-4031 (Part -4) 1988(RA-2009)	29.00 %	-
2	a) Initial Setting Time	IS-4031 (Part -5) 1988(RA-2009)	140 Minutes	Not Less than 30 Minutes
	b) Final Setting Time	IS-4031 (Part -5) 1988(RA-2009)	480 Minutes	Not More than 600 Minutes
3	Soundness by Le Chartlier Method	IS-4031 (Part-3) 1988(RA-2009)	1 mm	Not more than 10mm

*Information is furnished by the Customer/Representative.

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⇒ Any Query regarding the report must be reported within 30 days from the date of testing.

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Quality Manager

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T-2377

Job No.: CTCE/BBMP/W.No.06/YBR/CSR-07/083c/SAND-Gradation/2016-17 : 05.07.2016

TEST REPORT ON DETERMINATION GRADATION OF FINE AGGREGATES

* Customer	: **Asst. Executive Engineer,** Byatarayanapura Sub Division, BBMP, Bangalore.
* Agency	: **Mr. Y.B. Ramesh,** No.34, Down Bazaar Road, Yelahanka, Bangalore - 64.
* Name of Work	: Improvements to roads and drains at Anjanadri Layout in Ward No.06, Byatarayanapura Sub Division, BBMP, Bangalore.
Reference	: EE/BTP/BBMP/E-PMT/ /2015-16
Technical Reference	: IS : 2386 Part 1 - 1963 RA-2007
Sample ID	: Fine Aggregates
Sample Received on	: 04.07.2016
Date of Testing	: 05.07.2016

Total Wt. of Aggregates in gms **1000**

Is Sieve Size in mm	Cumulative Weight Passing in %	Specific Limits as per IS 383-1970 (RA- 2007)			
		Zone-I	Zone-II	Zone-III	Zone-IV
10	100	100	100	100	100
4.75	94.40	90-100	90-100	90-100	95-100
2.36	76.90	60-95	75-100	85-100	95-100
1.18	58.70	30-70	55-90	75-100	90-100
600 Micron	29.70	15-34	35-59	60-79	80-100
300 Micron	13.20	5-20	8-30	12-40	15-50
150 Micron	4.20	0-10	0-10	0-10	0-15

* Information is furnished by the Customer/Representative

Remarks : This sample is under Zone-I specific limits.

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Quality Manager

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Job No.: CTCE/BBMP/W.No.06/YBR/WMM/Gradation/2016-17 06.07.2016

GRADATION FOR WMM
MORTH TABLE-400-11

Customer : **Asst. Executive Engineer,** Byatarayanapura Sub Division, BBMP, Bangalore.

Agency : **Mr. Y.B. Ramesh,**
No.34, Down Bazaar Road, Yelahanka, Bangalore - 64.

Name of Work : Improvements to roads and drains at Anjanadri Layout in Ward No.06, Byatarayanapura Sub Division, BBMP, Bangalore.

Reference : EE/BTP/BBMP/E-PMT/ /2015-16

Date of Testing : 06.07.2016

Material : WMM

Sample Location : WMM Mix Plant Oven Dry Wt (gm): **8620**

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Spec.Limits
53	0	0	0	100	100
45	215	215	2.5	97.5	95-100
22.4	2650	2865	33.2	66.8	60-80
11.2	1405	4270	49.5	50.5	40-60
4.75	1250	5520	64.0	36.0	25-40
2.36	1010	6530	75.8	24.2	15-30
0.600	990	7520	87.2	12.8	8-22
0.075	800	8320	96.5	3.5	0-8

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Job No.: CTCE/BBMP/W.No.06/YBR/WMM/Gradation/2016-17 07.07.2016

GRADATION FOR WMM
MORTH TABLE-400-11

Customer : **Asst. Executive Engineer,** Byatarayanapura Sub Division, BBMP, Bangalore.

Agency : **Mr. Y.B. Ramesh,**
No.34, Down Bazaar Road, Yelahanka, Bangalore - 64.

Name of Work : Improvements to roads and drains at Anjanadri Layout in Ward No.06, Byatarayanapura Sub Division, BBMP, Bangalore.

Reference : EE/BTP/BBMP/E-PMT/ /2015-16

Date of Testing : 07.07.2016

Material : WMM

Sample Location : WMM Mix Plant Oven Dry Wt (gm): **8190**

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Spec.Limits
53	0	0	0	100	100
45	285	285	3.5	96.5	95-100
22.4	2450	2735	33.4	66.6	60-80
11.2	1250	3985	48.7	51.3	40-60
4.75	1095	5080	62.0	38.0	25-40
2.36	1005	6085	74.3	25.7	15-30
0.600	925	7010	85.6	14.4	8-22
0.075	780	7790	95.1	4.9	0-8

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Job No.: CTCE/BBMP/W.No.06/YBR/WMM/AIV/2016-17 06.07.2016

Aggregate Impact Value

IS: 2386 Part IV

Customer	**Asst. Executive Engineer,** Byatarayanapura Sub Division, BBMP, Bangalore.
Agency	**Mr. Y.B. Ramesh,** No.34, Down Bazaar Road, Yelahanka, Bangalore - 64.
Name of the Work	Improvements to roads and drains at Anjanadri Layout in Ward No.06, Byatarayanapura Sub Division, BBMP, Bangalore.
Reference	EE/BTP/BBMP/E-PMT/ /2015-16
Source / Location	WMM Plant
Type of Mix	Wet Mix macadam
Date of Testing	06.07.2016

Sl No.	Details	Trial No. 1	Trial No. 2	Average
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	378	380	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	78	79	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	300	301	
4	Aggregate Impact value = percent fines	20.63	20.79	
	100* (W_2/W_1)%			20.71

Comments:

→ Maximum allowable Aggregate Impact value for Wet mix Macadam is 30%

Note:

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Job No.: CTCE/BBMP/W.No.06/YBR/WMM/S-T/2016-17 06.07.2016

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Customer	**Asst. Executive Engineer,** Byatarayanapura Sub Division, BBMP, Bangalore.
Agency	**Mr. Y.B. Ramesh,** No.34, Down Bazaar Road, Yelahanka, Bangalore - 64.
Name of Work	Improvements to roads and drains at Anjanadri Layout in Ward No.06, Byatarayanapura Sub Division, BBMP, Bangalore.
Reference	EE/BTP/BBMP/E-PMT/ /2015-16
Technical Reference	IS 2386(Part 1) 1963 (RA 2011)
Type of Mix	Wet Mix Macadam
Date of Testing	06.07.2016

Result : Flakiness Index = **11.58%**

Elongation Index = **13.23%**

Result : Combined Flakiness & Elongation index **24.81%**

Comments:

Maximum allowable Flakiness & Elongation Index for Wet Mix Macadam is 30%

Note:

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Job No.: CTCE/BBMP/W.No.06/YBR/SDBC/AIV/2016-17 18.07.2016

Aggregate Impact Value

IS: 2386 Part IV

Customer	**Asst. Executive Engineer,** Byatarayanapura Sub Division, BBMP, Bangalore.
Agency	**Mr. Y.B. Ramesh,** No.34, Down Bazaar Road, Yelahanka, Bangalore - 64.
Name of the Work	Improvements to roads and drains at Anjanadri Layout in Ward No.06, Byatarayanapura Sub Division, BBMP, Bangalore.
Reference	EE/BTP/BBMP/E-PMT/ /2015-16
Source / Location	Hot Mix Plant, Bangalore
Type of Mix	Semi Dense Bituminous Concrete
Date of Testing	18.07.2016

Sl No.	Details	Trial No. 1	Trial No. 2	Average
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	378	380	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	78	79	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	300	301	
4	Aggregate Impact value = percent fines 100* (W_2/W_1)%	20.63	20.79	20.71

Comments:

→ Maximum allowable Aggregate Impact value for Semi Dense Bituminous Concrete is 27%

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Job No.: CTCE/BBMP/W.No.06/YBR/SDBC/Shape_T/2016-17 : 18.07.2016

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Customer	: **Asst. Executive Engineer,** Byatarayanapura Sub Division, BBMP, Bangalore.
Agency	: **Mr. Y.B. Ramesh,** No.34, Down Bazaar Road, Yelahanka, Bangalore - 64.
Name of Work	: Improvements to roads and drains at Anjanadri Layout in Ward No.06, Byatarayanapura Sub Division, BBMP, Bangalore.
Reference	: EE/BTP/BBMP/E-PMT/ /2015-16
Technical Reference	: IS 2386(Part 1) 1963 (RA 2007)
Type of Mix	: Semi Dense Bituminous Concrete
Date of Testing	: 18.07.2016

Result : Flakiness Index = **11.89%**

Elongation Index = **13.21%**

Result : Combined Flakiness & Elongation index **25.10%**

Comments:

Maximum allowable Flakiness & Elongation Index for Semi Dense Bituminous Concrete is 30%

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Job No.: CTCE/BBMP/W.No.06/YBR/SDBC/Stripping/2016-17 18.07.2016

Stripping Value of Road Aggregates (Static Immersion Test)

IS: 6241

Customer	**Asst. Executive Engineer,** Byatarayanapura Sub Division, BBMP, Bangalore.
Agency	**Mr. Y.B. Ramesh,** No.34, Down Bazaar Road, Yelahanka, Bangalore - 64.
Name of the work	Improvements to roads and drains at Anjanadri Layout in Ward No.06, Byatarayanapura Sub Division, BBMP, Bangalore.
Reference	EE/BTP/BBMP/E-PMT/ /2015-16
Type of Mix	Semi Dense Bituminous Concrete
Date of Testing	18.07.2016

Type of binder : 60/70
Percentage of binder used : 5.0% by wt.
Total weight of aggregate : 200 g
Total weight of binder : 10.0 g
Temperature of water-bath : 40° C

Observation Number	Stripping, Percentage	Average, Percentage	Average Retained Coating, %
1	3.1	3.20	96.80
2	3.2		
3	3.3		

Comments:

→ Minimum allowable Aggregate retained coating for Semi Dense Bituminous Concrete is 95%

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Job No.: CTCE/BBMP/W.No.06/YBR/SDBC/Sp_Wa/2016-17 18.07.2016

Specific Gravity And Water Absorption Test

IS: 2386 Part III

Customer	**Asst. Executive Engineer,** Byatarayanapura Sub Division, BBMP, Bangalore.
Agency	**Mr. Y.B. Ramesh,** No.34, Down Bazaar Road, Yelahanka, Bangalore - 64.
Name of the Work	Improvements to roads and drains at Anjanadri Layout in Ward No.06, Byatarayanapura Sub Division, BBMP, Bangalore.
Reference	EE/BTP/BBMP/E-PMT/ /2015-16
Type of Mix	Semi Dense Bituminous Concrete
Source / Location	Hotmix Plant, Bangalore
Date of Testing	18.07.2016

Sl. No.	Details	Notation	Test Number			Mean Value
			Test 1	Test 2	Test 3	
1	Weight of aggregate suspended in water with the basket	W_1 g	2002	2005	2001	
2	Weight of basket suspended in water	W_2 g	755	755	755	
3	Weight of saturated aggregate in water	$(W_1 - W_2) = W_s$ g	1247	1250	1246	
4	Weight of saturated surface dry aggregate in air	W_3 g	2015	2016	2018	
5	Weight of water equal to the volume of the aggregate	$(W_3 - W_S)$ g	768	766	772	
6	Weight of oven dried aggregate	W_4 g	2005	1998	1999	
7	Specific Gravity	$W_4/(W_3-W_S)$	2.611	2.608	2.589	2.603
8	Apparent Specific gravity	$W_4/(W_4-W_S)$	2.645	2.671	2.655	2.657
9	Water Absorption	$((W_3-W_4)*100)/W_4$	0.50%	0.90%	0.95%	0.78%

Comments:

→ Maximum allowable Aggregate Water absorption value for Semi Dense Bituminous Concrete is 2.0%

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Job No.: CTCE/BBMP/W.No.06/YBR/SDBC/Bitumen/2016-17 18.07.2016

BITUMEN CONTENT AND GRADATION DETERMINATION OF SEMI DENSE BITUMINOUS CONCRETE MIX

As per IS2386 and IRC:SP:11-1984

CUSTOMER	**Asst. Executive Engineer,** Byatarayanapura Sub Division, BBMP, Bangalore.
AGENCY	**Mr. Y.B. Ramesh,** No.34, Down Bazaar Road, Yelahanka, Bangalore - 64.
NAME OF THE WORK	Improvements to roads and drains at Anjanadri Layout in Ward No.06, Byatarayanapura Sub Division, BBMP, Bangalore.
REFERENCE	EE/BTP/BBMP/E-PMT/ /2015-16
SAMPLE I/D	Roads in Anjanadri Layout in Ward No.06
DATE OF TESTING	18.07.2016

BITUMEN CONTENT DETERMINATION

Description	Trail 1	Trail 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	475.5	473.5
3. Weight of Asphalt and Mineral matter Extracted,	-	-
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g		
6. Weight of Bitumen Extracted, g. (corrected)	24.5	26.50
7. Bitumen content in %	4.90	5.30
8. Average	**5.10**	

GRADATION AFTER EXTRACTION

SIEVE SIZE	Trail 1				JOBMIX
mm	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	Gradation
13.2	0	0	0	100	100
9.5	32.36	6.81	6.81	93.19	90-100
4.75	266.5	56.05	62.85	37.15	35-51
2.36	34.25	7.20	70.05	29.95	24-39
1.18	40.25	8.46	78.52	21.48	15-30
0.3	45.36	9.54	88.06	11.94	9-19
0.075	32.25	6.78	94.84	5.16	3-8

SIEVE SIZE	Trail 2				JOBMIX
mm	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	Gradation
13.2	0	0	0	100	100
9.5	33.26	6.65	6.65	93.35	90-100
4.75	259.6	51.92	58.57	41.43	35-51
2.36	56.69	11.34	69.91	30.09	24-39
1.18	46.36	9.27	79.18	20.82	15-30
0.3	32.56	6.51	85.69	14.31	9-19
0.075	43.36	8.67	94.37	5.63	3-8

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